

This took place just 135 years before the advent of the Portuguese deserters Herr Haas describes as the first Europeans reaching Japan; and if so, what were these "Nambans" of the years 1407-8, the first instance, so far as I know, of the name in the Japanese records of this sort?

In the same review, the writer, talking about Xavier's labours, says:—

"What would be interesting and instructive to know would be what the Japanese, especially the Buddhists and Confucianist scholars, thought of his doctrines. No hint has come down to us—perhaps they took no thought of a strange religion that seemed of no importance."

As he expresses it at the same time, Xavier's stay was too short to qualify him to make his dogmatic teaching in its utmost expression; but one must not conclude thereby that in the same century Japan was totally destitute of the native scholars of repute taking interest in the subject of Christianity. Thus we read in a eulogy on Master Seigwa (1561-1619), the greatest of all Confucianists of that age, that he was thoroughly learned not only in all Japanese and Chinese literatures, but, moreover, "as well in the books of the Buddhists in India as in the doctrines of Jesus Christ of the South Barbarians" (Oota, "Ichiwa Ichigen," ed. 1885, tom. xix, fol. 19, b).

As the native documents and treatises of any concern to Christianity were well-nigh annihilated under the most rigorous inquisitions, which were mainly incurred by the so-called South Barbarians intermeddling with the political affairs of the country, and which that religion continued to undergo during the two centuries of the Tokugawa Shōgunacy, practically no hint has come down to us of what the native scholars thought about it before the persecution began. From what are left dispersed in their works, however, we may be fair in judging that most of the intelligent Japanese, then and directly after, described in the tenets and rituals of Roman Catholicism nothing but an especial form of Buddhism. To the Europeans, Nobunaga's dictum on its toleration is well known—"While there exist so many sects already, why do we not let this sect stand?" Kumazawa Ryōkai (1619-91), the renowned Confucianist reformer in politics, calls the creed simply Southern Buddhism, i.e. Buddhism of the South Barbarians. Later, Arai Hakuseki (1657-1723), after repeatedly giving ear to the Roman missionary, J. B. Sidoti, is said to have remarked upon the subject, "His doctrine is as absurd as Buddhism, they differing from one another only in the points of their terminology" (Amenomori's "Adversaria," ed. 1892, vol. x, p. 86). Parallel to these, I remember I have read in a letter of Xavier's contained in Ramusio's "Viaggi e Navigationi" a passage implying his recognition of some Christian essence in the Buddhist dogmas then current in Japan.

As I recollect there was in a back number of NATURE a certain though very brief reference to a Life of J. B. Sidoti, it will be *apropos* of this letter to give a few facts relating to him, which, I think, are not so well known now among Christians as they ought to be. Arai Hakuseki, mentioned above, was a man of singular parts, extensively erudite, notorious in poetry even in China, very active in politics of the court at Yedo, and nowadays nobody denies him the honour of the first introducer of the western science into the Land of the Rising Sun. This innovation, however, was simply the result of his official interviews with that devoted but unfortunate missionary in 1709 A.D. Sidoti professes to have made himself adept in the Japanese language at Rome, but after all his acquirements appear to have been too limited to make him speak freely in it. So Hakuseki made every effort in his brain to secure from him accurate information on subjects of the regions, then perfectly unknown to the Japanese, through a Dutchman's interpretation, observing on the difficulties of the task at the outset, "Still is it reasonable to suppose that all this stranger's words are nothing but a shriek's shrieks?" The results of these conversations were the two works "Choice Reviews of a Foreigner's Tales" and "A Memoir on the Western Ocean," which formed the principal cause of the eighth Shōgun's edict to tolerate the reading of the European books pertaining to science and arts, the *sine qua non* of their wholesale importation in these present days. That all the conduct of Sidoti greatly affected Japanese minds, in spite of their hatred of his creed, is borne out by a letter he wrote in a prison, whereby he petitioned the

authority to chain him tightly in cold winter nights, in order to let the miserable watchmen about him enjoy their sleep at ease (see Oota, *op. cit.*). Immediately after Hakuseki's remark on his religion quoted above, this passage follows:—"But his personality was so uncommon that it makes me ever unable to forget him!" And it will be greatly gratifying and edifying to the modern Christians to reflect upon how powerful the unparalleled morality of this single, forlorn missionary was after his death, in effecting the reopening of the doors, which his nominal brethren, the very worthy "South Barbarians," had caused the Japanese to shut against themselves. In fact, Yuasa's "Miscellany from a Literary Society" tells us, "Hakuseki used to say all Sidoti's deportments convinced him in the belief that even the Five Virtues of our Sage were no more than what that missionary daily carried himself with"; an unexampled encomium uttered on a Christian by the followers of the great Chinese philosopher!

KUMAGUSU MINAKATA.

Mount Nachi, Kii, Japan, March 10.

Sir O. Lodge and the Conservation of Energy.

THE utterances of many men of science as to the doctrine of the conservation of energy betray a tendency to exaggerate the importance of the position of this principle in the general scheme of physical science. It appears sometimes to be forgotten that the principle of energy, if applied to even the simplest dynamical system which is possessed of more than one degree of freedom, is, taken by itself, wholly insufficient for the determination of the motion of such system. Although the principle has been of inestimable value as regulative of the relations between the different forms of molar, molecular, and corpuscular energy which the state of our knowledge compels us to distinguish, it is nevertheless true that in an ultimate dynamical formulation of physical phenomena, the principle of energy descends to the rank of being one integral only of the dynamical equations of a system, a knowledge of the other integrals being indispensable for the complete determination of the motions of the system.

This tendency to exaggeration is illustrated in a very striking manner in the interesting paper by Sir O. Lodge on "Interaction between the Mental and the Material Aspects of Things" (see NATURE, April 23, p. 595). Sir O. Lodge, in discussing the question whether the assumption of a direct action of life upon matter is consistent with physical laws, advances the theory that, although life cannot generate mechanical energy, it can exert guiding mechanical forces which do no work on matter. Sir O. Lodge appears to think that by restricting the action of the psychical on the physical in this way, he has suggested a compromise which ought to satisfy the supporters of naturalism whilst it at the same time leaves sufficient play for the action of the psychical.

The really fundamental issue between the advocates of thorough-going naturalism and their opponents is at bottom the following:—Can the human body, or the physical world including living organisms, be rightly regarded as theoretically completely representable as a dynamical system, in such a manner that the whole of the motions of the system are completely determinate in accordance with the laws of dynamics? Is the physical a complete system without taking account of any action on it arising from the psychical, or is it, on the other hand, necessary to suppose that an action of the psychical on the physical exists, without which the actual motions of the physical cannot be completely determined? If the latter question be answered affirmatively, then it makes no difference in principle whether such action of the psychical does work, or whether it can be represented by the introduction into the dynamical system of *ex hypothesi* unknown frictionless constraints; in either case the laws of physics, regarded as a sufficient system for the determination of all motions, fall to the ground.

Sir O. Lodge's contention "that the fundamental laws

1 Mildness, Faithfulness, Self-Respect, Respect to Others, and Compassion. When asked about Confucius's character, Tszu-Kung, the most eloquent of all his disciples, enumerated these as its five components. In the eighteenth century there was a Confucianist master in Japan who opined it wise to substitute in the temples the five letters signifying them written on scrolls for the images of the philosopher. See the "Analects of Confucius" and the "Kwagetsu Shinshi."

of physics, complete and accurate as they are, in no way exclude guidance of events by the agency of life or mind or other unknown influence" cannot, it appears to me, be regarded as true in any sense relevant to the main issue between naturalism and its opponents; that his contention holds because the psychic can be supposed to be sufficiently dexterous to apply all its interfering forces on matter "perpendicular to the direction of motion" is, to my thinking, a complete fallacy based upon an undue estimate of the importance of the conservation of energy as compared with a more general formulation of dynamics.

In an earlier part of his paper Sir O. Lodge has endorsed a somewhat different form of statement: "That life is something outside the scheme of mechanics, although it can nevertheless touch or direct material motion, subject always to the laws of energy and *all other mechanical laws* (the italics are mine) supplementing them, but contradicting or traversing them no whit." In this statement Sir O. Lodge has deigned to recognise the existence of the other mechanical laws. Considering that the motions of all the parts of a mechanical system are completely and uniquely determinate by means of the law of energy and all the other mechanical laws, it seems difficult to understand how room is left for supplementing these laws, or how the psychic can interfere in a mechanical system at all without traversing mechanical laws.

I have no intention of expressing any opinion whatever on the main point of dispute between naturalism and its opponents, or of discussing the question whether our experience of the world can be adequately represented by a dualism of the physical and the psychical. My sole object has been to show that in suggesting that, provided the psychical does not generate energy, it does not, by the impressing of force, really interfere with the completeness of the system of physical laws, Sir O. Lodge has simply drawn a herring across the path of the controversy between naturalism and its opponents.

E. W. HOBSON.

Christ's College, Cambridge, April 25.

Density and Change of Volume of Nova Persei.

DR. RITTER, when dealing with stellar atmospheres, touched upon the question of pulsation periods and changes of density of gaseous stars. His deductions are that the brightness of a variable (gaseous) star is inversely proportional to the square of its volume, and also that the period of pulsation varies inversely as the square of the star's density. Now Nova Persei's periods of pulsation have increased from about one day to five days and longer, from which changes, according to Dr. Ritter, we can estimate that the star's density has diminished from $1/10$ to $1/300$ of that of water. The square of the ratio of these two fractions is $1/900$. The brightness of Nova Persei should have decreased to this fraction, which is equal to a decrease of about seven magnitudes.

Important information as to the constitution of this star might be gained if a rigorous comparison between pulsation period and brightness could be carried out.

Dr. Ritter's investigations will be found in Wiedmann's *Annalen*, 1879, vol. viii. p. 177, and 1881, vol. xiii. p. 367.

C. E. STROMEYER.

A Katydid's Resourcefulness.

DURING the past summer an intimate friend of the writer's observed a peculiar case analogous to the Irishman's "spitting on his hands for a fresh hold." An ordinary katydid, in trying to climb along the slats of a window blind that were very smooth owing to the glazed surface of the paint, kept slipping on the smooth surface. It would raise one front leg and then the other, bringing the foot or claw to its mouth, and there wet it with the "molasses" which exuded from the creature's crop. Is this one of the practical uses made by the locust family of this sticky fluid to enable it to walk upon very smooth surfaces? If so, the writer has never had it brought to his notice before.

Iowa City, Ia., October, 1902.

ARTHUR G. SMITH.

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ABORIGINAL REMAINS IN N.W. FLORIDA.¹

THE first of these two papers deals with archaeological investigations along the coastal region of N.W. Florida, being a continuation of the searches conducted during ten successive seasons along other portions of the coast and the waterways running down to it. The work on this occasion was principally centred in the districts around Perdido Bay, Pensacola Bay, Santa Rosa Sound, and Choctawhatchee Bay. As has hitherto been the case in the investigation of Floridan antiquities, a rich harvest resulted, mainly of objects of pottery. This in spite of the excavation craze which has led numbers of unskilled searchers to probe the soil for its buried treasures. "In no part of Florida," writes Mr. Moore, "is the pursuit of this *ignis fatuus* so intense, and persons, otherwise sane, seemingly, spend considerable portions of their time with spade and divining rod in fruitless search." Some twenty mounds were investigated, and the paper is devoted mainly to a detailed description of the finds. Numerous interments were discovered; the greater number of the skeletons were, however, incomplete. The custom of burying the remains of the dead under inverted earthenware bowls of large size was evidently very prevalent, and recalls the similar practice observed by the pre-dynastic Egyptians. An interesting custom is revealed in connection with the pottery vessels found with the greater number of interments. Very many of the pots buried with the dead exhibit a hole purposely broken through the base, this having been done, it is believed, in order to "kill" the vessel to free its spirit to accompany that of the departed. This custom was seemingly very largely practised, and must have been associated with a system of primitive animistic philosophy which is almost world-wide, and which finds expression under different, though kindred, forms of manifestation.

The finding of a definite class of mortuary pottery is also of great interest. These ceremonial pots were usually small, often somewhat fantastic in form, and of poor materials, and a very interesting feature consists in their basal perforations having been made *at the time of manufacture*. These vessels were, in fact, made for ceremonial "killing"—one may say, were made ready-killed—and they served as cheap substitutes for the more valuable useful forms. A parallel is thus afforded to the modern Chinese practice of burning at funerals cheap paper models of useful objects, money, &c., and to the specially-made valueless burial coins of Egypt and elsewhere.

The decoration upon the pots is for the most part bold in design, and incised or stamped, at times exhibiting zoomorphic or anthropomorphic themes in partial or complete relief. Some of the incised scroll-work is very skilfully executed, and gives a bold, intricate and effective pattern, notably in the case of a fine vase from a mound near Point Washington.

The second short paper deals with researches conducted along the Tombigbee River by the same explorers. A large number of mounds and camp sites were examined, and about 178 miles of the river banks were searched. The results were disappointing, and but poorly rewarded the labour expended. The mounds were largely domiciliary, and the finds from them were few in number. The author gives a complete list of mounds and camp sites along the region examined, and of the names of the owners of the properties upon which they stand, and this should prove very useful to future investigators.

¹ "Certain Aboriginal Remains of the North-West Florida Coast and the Tombigbee River." Two papers by Clarence B. Moore. *Journ. of the Academy of Natural Sciences of Philadelphia*, second series (vol. xi., part 4, 1901.)